

## **DEPARTMENT OF PLANT BREEDING & GENETICS**

### **PROFILE:-**

The Department of Plant Breeding & Genetics was established in 1980 for M.Sc. (Ag) degree programme at JNKVV, College of Agriculture, Gwalior. Since then 100 students have received Post graduate degree till to date. The department has one UG and PG laboratory at present which is well equipped with interactive board and multimedia. The first batch of Ph.D enrolled in second semester 2010-11. Since then two students have received Ph.D Degree. At present student intake capacity of PG and Ph.D programmes are 9 and 6 respectively.

### **BACKGROUND:-**

The Department of Plant Breeding & Genetics has budded as an offshoot from the erstwhile Agricultural Botany in the year 1980. This accelerated the pace of crop improvement as regard to productivity, quality and sustainability, thereby improving the livelihood of farming community.

### **MISSION:-**

The mission of this department to develop human resource in the subject and genetic improvement of field crop for food and nutritional betterment.

### **MANDATE:-**

1. To manipulate genetic architecture to develop suitable varieties of various crops.
2. To produce and maintain recommended crop varieties for quality seed production programme.
3. To serve as a centre of teaching in the field of Plant Breeding & Genetics including allied sciences.
4. To serve as a center of basic research in the field of Plant Breeding & Genetics including allied sciences.

### Details of Scientist and other staff:-



**Dr A.K.Singh**  
**Professor.& HOD**

0751-2460581(o),  
0751-2341691(Fax),  
9425308850,(Mob)  
**hodpbg2009@gmail.com**

### FACULTY

S.No	NAME	DESIGNATION	SPECIALIZATION	CONTACT NO /EMAIL ID
1.	Dr.A.K.Singh	Professor.& HOD	Crop Improvement	0751-2460581(o), 0751-2341691(Fax), 9425308850,(Mob) hodpbg2009@gmail.com
2.	Dr.V.S.Kandalkar	Professor	Plant Breeding Quantitative Genetics	9425087311,(Mob) vsk_1987@yahoo.co.in
3.	Dr.A.K.Sharma	Asso.Professor	Plant Breeding Quantitative Genetics	9425008044,(Mob) Arvindatma@gmail.com
4.	Dr.R.S.Sikarwar	Asstt.Professor	Plant Breeding Quantitative Genetics	9425129059,(Mob) ravendra484@gmail.com
5.	Sh.Y.M.Indapurkar	Tech.Assistant & PRO,RVSKVV	Plant Breeding	9425116322,(Mob) prorvskvv@gmail.com
6.	Sh.Sudhanshu Jain	I/C.Farm & Tech.Assistant	Plant Breeding	9425488882,(Mob) sudhanshujain07@yahoo.in
7.	Sh.Rajveer S.Parmar	F.E.O		9425776127,(Mob)
8.	Hassu Shah	Peon		9300562091,(Mob)

## Other Campus Faculty

S.No	NAME	DESIGNATION	SPECIALIZATION	CONTACT NO /EMAIL ID
1.	Dr.Jagdish Singh	Principal Scientist COA,Indore	Plant Breeding	9425958713 (Mob) Safflowerjagdish@yahoo.com
2.	Dr.(Smt) Induswaroop	Principal Scientist COA,Indore	Plant Breeding	
3.	Shri V.P Kataria	Scientist (Sel.Grade) COA,Indore	Plant Breeding	9827737696 (Mob)
4.	Dr.D.K.Shrivastava	Scientist / (Tech.Asstt.) COA,Indore	Plant Breeding	9425953270 (Mob) Shrivastavamedherbs @rediffmail.com
5.	Dr.M.K.Saxena	Scientist / (Tech.Asstt.) COA,Indore	Plant Breeding	9425082622 (Mob)
6.	Dr.Smt.Usha Saxena	Scientist / (Tech.Asstt.) COA,Indore	Plant Breeding	9425351213 (Mob) umsax@rediffmail.com
7.	Dr.Sunil Holkar	Scientist / (Tech.Asstt.) COA,Indore	Plant Breeding	9425437871 (Mob) s.holkar@yahoo.co.in
8.	Shri Lekhram	Scientist COA,Khandwa	Plant Breeding	9425909835 (Mob) lekhramscientist@gmail.com
9.	Dr.H.Patidar	Principal Scientist COH,Mandsaur	Plant Breeding	9926478278 (Mob) drhpatidar@gmail.com
10.	Sh.Basant Kacouli	Asstt.Professor COH,Mandsaur	Plant Breeding	94240009900 (Mob) kachouli@yahoo.com
11.	Dr.N.S.Bhadouriya	SMS, KVK,Lahar Bhind	Plant Breeding	9669618483(Mob) nsbhadouriya@yahoo.co.in
12.	Sh Puspendra singh	SMS,KVK, Shivpuri	Plant Breeding	8959831539 (Mob) Singhpuspendrar

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13.	Dr.S.K.Kaushik	SMS,KVK,Ujjain	Plant Breeding	9977050608 (Mob) Kaushik.surendra @rediffmail.com
14.	Sh.Surendra Babu Sharma	SMS,KVK,Ratlam	Plant Breeding	9977170914 (Mob) kvkratlam@gmail.com
15.	Dr.S.R.Ramgiry	Principal Scientist RAK,COA,Sehore	Plant Breeding	8982305368 (Mob) Sr.ramgiry57@gmail.com
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17.	Dr.A.N.Tikle	Senior Scientist RAK,COA,Sehore	Plant Breeding	9424468264 (Mob) antiklep@gmail.com
18.	Shri.Ashok Saxena	Tech.Asstt. RAK,COA,Sehore	Plant Breeding	9893476337 (Mob) Ashoksaxena04 @rediffmail.com
19.	Dr.V.K.Tiwari	Senior Scientist ZARS,Morena	Plant Breeding	9425407723 (Mob) Vkt786@yahoo.co.in
20.	Dr.M.K.Tripathi	Senior Scientist ZARS,Morena	Plant Breeding	
21.	Shri Dinesh Awasthi	Tech.Asstt ZARS,Morena	Plant Breeding	9584709675 (Mob)
22.	Dr.V.S.Bhadauria	P.A,KVK,Gwalior	Plant Breeding	9826776808 (Mob)

**M. Sc (Ag) Students Received Degree (1980 to 2014-15) – 100**

**Ph.D Student Awarded Degree; 02**

**Number of PG/Ph. D Students registered (RVSKVV, GWALIOR)**

• M. Sc. (Ag) admitted (New Course) in	2009-10:	06
• Ph. D. admitted in	2009-10:	NIL
• M. Sc. (Ag) admitted (New Course) in	2010-11:	07
• Ph. D. admitted in	2010-11:	03
• M.Sc. (Ag) admitted (New Course) in	2011-12:	08
• Ph. D. admitted in	2011-12:	02
• M.Sc. (Ag) admitted (New Course) in	2012-13:	08
• Ph. D. admitted in	2012-13:	01
• M. Sc. (Ag) admitted (New Course) in	2013-14:	09
• Ph. D. admitted in	2013-14:	04
• M. Sc. (Ag) admitted (New Course) in	2014-15:	09
• Ph. D. admitted in	2014-15:	02

**PROGRAMME OFFERED IN UG PROGRAMME:-**

<b>Semester</b>	<b>Courses</b>	<b>Credit</b>
I	Principles of Genetics	3(2+1)
II	Principles of Seed Technology	3(2+1)
III	Principles of Plant Breeding	3(2+1)
IV	Breeding of Field/ Horticultural Crops <sup>3</sup>	3(2+1)
V	Principles of Plant Biotechnology	3(2+1)
VI	ELPD Module I Seed Production Technology	3(1+2)

**PROGRAMME OFFERED IN PG PROGRAMME:-****Ist SEMESTERWISE DISTRIBUTION OF M.Sc.(Ag) PLANT BREEDING & GENETICS COURSES(2011-12)**

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
<b>MAJORCOURSES</b>		
GP501	Principles of Genetics	2+1
GP502	Principles of Cytogenetic	2+1
GP503	Principles of Plant breeding	2+1
GP508	Cell Biology and Molecular genetics	2+1
	<b>Total</b>	<b>12</b>
<b>Minor</b>		
Pl,Path513	Disease resistance in plants	2+0
Pl.Path505	Detection & diagnosis of plant diseases	0+2

<b>Supporting</b>		<b>04</b>
STAT511	Statistical methods for applied Sciences	3+1
	<b>Total</b>	<b>04</b>
PGS501(NC)	Library & Information Services	0+1
PGS502(NC)	Technical Writing & Communication Skill	0+1
PGS503(NC)	Intellectual property & Its management in Agriculture	1+0
	<b>Total</b>	<b>3</b>

## 2<sup>ND</sup> SEMESTERWISE DISTRIBUTION OF COURSES

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
<b>Major Courses</b>		
GP515	Maintenance Breeding and concept of Variety release and seed production	1+1
GP504	Principles of Quantitative Genetics	2+1
GP509	Bio Technology for Crop Improvements	2+1
	<b>Total</b>	<b>8</b>
<b>Minor</b>		
Pl.Path516	Integrated disease management	3(2+1)
ENT511	Pest of Field crops	2(1+1)
	<b>Total</b>	<b>5</b>
<b>Supporting</b>		
STAT512	Design of Experiments	2+1
	<b>Total</b>	<b>3</b>
PGS504(NC)	Basic Concept in Laboratory Technique	0+1
PGS505(NC)	Agricultural Research, Research Ethics and Rural development program	1+0
PGS506(NC)	Disaster Management	1+0
	<b>TOTAL</b>	<b>3</b>

**3<sup>rd</sup> SEMESTER WISE DISTRIBUTION OF COURSES**

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
GP591	Seminar	1+0
GP599	Masters Research	10
	<b>Total</b>	<b>11</b>

**4<sup>th</sup> SEMESTER WISE DISTRIBUTION OF COURSES**

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
GP599	Masters Research	10
	<b>Total</b>	<b>10</b>

**PROGRAMME OFFERED IN Ph.D PROGRAMME:-****I<sup>st</sup> SEMESTERWISE DISTRIBUTION OF PLANT BREEDING& GENTICS COURSES**

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
<b>MAJORCOURSES</b>		
GP 601	Plant Genetics resources and Pre-Breeding	2+0
GP 604**	Molecular and chromosomal manipulation in crop plant	2+0
GP 605**	Advances in plant Breeding Systems	2+0
	<b>TOTAL</b>	<b>06</b>
<b>Minor</b>		
ENT 606	Recent trends in Biological Control	1+1
	<b>Total</b>	<b>02</b>



<b>Supporting</b>		<b>04</b>
STAT 521	Applied regression Analysis	2+1
	<b>Total</b>	<b>03</b>
PGS501(NC)*	Library & Information Services	0+1
PGS502(NC)*	Technical Writing & Communication Skill	0+1
PGS503(NC)*	Intellectual property & Its management in Agriculture	1+0
	<b>Total</b>	<b>3</b>

### 1) 2<sup>ND</sup> SEMESTERWISE DISTRIBUTION OF COURSES

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
<b>Major Courses</b>		
GP 603**	Genomics in Plant Breeding	2+1
GP 602	Advanced Biometrical & Quantitative Genetics	2+1
GP 608	Advances in Breeding major field crops	3+0
	<b>Total</b>	<b>09</b>
<b>Minor</b>		
ENT 608	Advance Host Plant resistance	1+1
ENT 611	Molecular approaches in Entomological research	1+1
ENT 612	Advanced Integrated pest management	2+0

<b>Supporting</b>		06
STAT 531	Data analysis using statistical packages	2+1
	Total	03
PGS504(NC)*	Basic Concept in Laboratory Technique	0+1
PGS505(NC)*	Agricultural Research, Research Ethics and Rural development program	1+0
PGS506(NC)*	Disaster Management	1+0
	<b>TOTAL</b>	<b>3</b>

## 2) 3<sup>rd</sup> SEMESTER WISE DISTRIBUTION OF COURSES

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
GP691	Seminar	1+0
GP699	Masters Research	10
	<b>Total</b>	<b>11</b>

## 4.4<sup>th</sup> SEMESTER WISE DISTRIBUTION OF COURSES

<b>COURSE NO.</b>	<b>NAME OF COURSE</b>	<b>CREDITS</b>
GP691	Seminar	1+0
GP699	Masters Research	10
	<b>Total</b>	<b>11</b>

### 5.5th SEMESTER WISE DISTRIBUTION OF COURSES

COURSE NO.	NAME OF COURSE	CREDITS
GP699	Masters Research	10
	<b>Total</b>	<b>10</b>

### 6.6th SEMESTER WISE DISTRIBUTION OF COURSES

COURSE NO.	NAME OF COURSE	CREDITS
GP699	Masters Research	15
	<b>Total</b>	<b>15</b>

**TECHNOLOGY PRODUCT DEVELOPED:** - The following crop varieties recommended for the state.

Crop	Recommended varieties
<b>Soybean</b> (Early)	JS.95-60,JS.93-05,JS.71-05,JS.90-41
(Medium )	RVS.2001-04, JS.335, NRC.37.JS.75-46, NRC.12.
(Late)	JS.80-21, JS.97-52, JS.72-280.
<b>Maize</b>	JM.8,JM12,JM.216,Ganga white-2,JM.13,J.POP-11,African Tall (F),C.M.-3, J.B.M.-421,H.P.Q.M-.1(Hybrid)P.E.M.H-1,P.E.M.H-2.
<b>Sorghum</b>	J.J-938, J.J.-1041, J.J-1022, J.J.-741, C.S.H-.18, I.M.S-.9A, 9B, Indore-12.
<b>Bajra</b>	JBV-2, JBV-3, JBV-4, HHB-67(Improved) (hybrid), GHB-744.
<b>Black Gram</b>	JU-3, PDU-1, LBG-20, TAU-1, PU-35, PU-19, JU-86, T-9, PU-30.
<b>Green Gram</b>	JM-721,TARM-1,K-851,TM-98-50,HUM-1,PUSAVISHAL,PDM-139,PDM-11,PDM-54,Ganga-8,TM-99-37,TJM-3.
<b>PADDY</b> (Early)	JR-201, JR-353, JR-345, JR-503, JR-504.
(Medium)	Kranti,IR-64,Mahamaya,Pusa Songhandha-3, Pusa Songhandha-5,Pusa Basmati-1,Madhuri,PS-4.
(Hybrid)	JRH-4, JRH-5.
<b>TILL</b>	JT-21, JT-22, JT-55, TKG-8, TKG-306.
<b>Cotton</b>	RB-50, K-2, Vikram k-4 Maljari, Tapti, JCC-1.

<b>Sunflower</b>	Morden, MSFH-17.
<b>Arhar</b>	JKM-7, TJT-501, RVCPH-2671 (Hybrid), JKM-189, RVA-28.
<b>Groundnut</b>	JL-24, JGN-3, TG-26, TG-24, TG-41, TG-37, JGN-23.
<b>Wheat</b>	
Partial Irrigaed (1-2 ),10 Novenmber,	C-306,Sujata,JWS-17,HW-2004(Amar),HI-1500(Amarta),MP-3020,HI-1531,(Harshita),HI-8627,(Malwa kranti),HD-4672 (Malab rattan).
Irrigated Timely sown (3-5 ),25 November )	GW-190,GW-273,GW-322,GW-366,DL-803-3(Kanchan),MP-1142,HI-1479(Swarna),Raj-1555,HI-8381(Malabshri),HI-8498(Malabshakti).
Irrigated Late sown (3-4 ),25 November)	M.P-4010,HI-1418(Navin chaduos),DL-788-2(Vidhisha),GW-173,HD-2285,HI-1454(Abha),HD-2864,HI-8498,RVW-4106,MP-1203.
Irrigated exteme late (4-5)15January	MP-4010, HD-2402, Raj3777, HI-1418, HD-2864, HD-2932.
Irrigated saline soils (4-5)	Raj-3077, JBO-666, KRL-19.
<b>Gram (Desi)</b>	JG-16,BG-1053,JG-412,JG-6,JG-11,Jaki-92-18,JG-130,JG-315,JG-322,JG-218,Vijay vishal, Uday JG-226,IPCK-2004-29,RVG-201.
<b>Gram (Kabuli)</b>	RVKG-101, JG-1, JKG-3, RVSJKG-102 Fule G-0517, KAK-2, PKV-4, RVG-203.
<b>Pea</b>	Arkel, AP-3 JM—6, Pusa Pragati.
<b>Barseem</b>	JB-1, JB-5, PB-1.
<b>Oat</b>	Kent, JO-1.
<b>Linseed</b>	JLS-9,JLS-23-10,JLT-27,JLT-26
<b>Safflower</b>	JSF-1, JSF-7, JSF-73, JSF-97, JSF-99, RVS-113.
<b>Lentil</b>	JL-3, JL-1, Nori (IPL-81), RVL-31.
<b>Mustard</b>	JM-1, PusaBold, JM-2, JM-4, Rohidi, PusaJay kisan, JM-3, RVM-2.
<b>Toriya</b>	JT-1
<b>Sugarcane</b>	COJN-86-141, CO-86032, COC-671, CO-6527, CO-7318, CO-6304, CO-86-572.

### **SIGNIFICANT ACHIVEMENT: - Research Projects Of The Department**

- AICRP on Pearl millet
- AICRP on Wheat
- AICRP on Groundnut
- Millet Improvements scheme (State Plan)

### **WHEAT TECHNOLOGY DEVELOPED: Main Features of MP 4010**

1. It is recommended for central zone
2. Average grain yield is 40.10 q/ha
3. Good appearance, bold size and amber color grain
4. Resistant to both stem and leaf rusts.
5. Maturity: 108 days
6. Height: About 80-85 cm
7. Tolerant to terminal heat & drought
8. Its hectoliter weight is around 82.4.
9. Its sedimentation value is 48.5
10. Protein is about 12.6%



### **RVW 4106 Main Features**

1. It is recommended for late sown irrigated condition in MP
2. Average grain yield is 45-55 q/ha
3. Bold size and amber color grain
4. Resistant to both stem & leaf rusts
5. Maturity: 112 days
6. Height: About 87± 15 cm
7. Tolerant to terminal heat & drought
8. Its hectoliter weight is around 79.7
9. Its sedimentation value is 49.0
10. Protein is about 13.55%
11. Notification No. DL-33004 / 99, No. 408 dated 16-03-2012



### PEARL MILLET TECHNOLOGY DEVELOPED JBV-2 (OPV) MP309 released in 1999

01	Parentage	Developed from early composite 91(EC-91) bred by random mating 140 S1 progenies
02	Maturity	70-75days
03	Grain Type	Globular,small(Test weight,7.43g)
04	Biotic stress	Resistant toDowney mildew
05	Abiotic stress	-
06	Recommended regions	Rajasthan,Gujrat,M.P.,Haryana,U.P. and Punjab
07	Areas of adoption	MP and A zone of Country
08	Special attributes	Spike Cylendrical Yellow anther,bristles absent exertion complete
09	Average yields	1.8-2.0 t/ha
10	Scientist involved	Dr.A.K.Singh,Dr.G.S.chauhan
11	Year of release	1999
12	notification	SO.425(E) 8.6.99



### PEARL MILLET: JBV-3(OPV) MP363 RELEASED IN 2000.

01	Parentage	Developed by random mating of 15 full sib progenies
02	Maturity	70-75 days
03	Grain Type	Obviate ,medium(Test weight,8.66g)
04	Biotic stress	Resistant to downey mildew
05	Abiotic stress	-
06	Recommended regions	Rajasthan, Gujarat, M.P., Haryana, U.P. and Punjab
07	Areas of adoption	M.P.and A zone of Country
08	Special attributes	Spike Cylindrical long(33.1 cm) Yellow white anther, bristles absent exertion complete
09	Average yields	20-26q/ha
10	Scientist involved	Dr.A.K.Singh,Dr.G.S.chauhan,Dr.R.K.Pandya
11	Year of release	2000
12	notification	SO.92(E) 2.2.01



**Pearl millet (OPV): JBV-4 (Release in 2006 by Govt. of M.P.)**

01	Parentage	Bred by random mating 212 S1 progenies from C3 cycle of early smut resistant composite (ESRCII)
02	Maturity	75 days
03	Grain Type	Obovate to lanceolate
04	Biotic stress	Resistant to downy mildew disease
05	Recommended regions	Madhya Pradesh
06	Areas of adoption	Bhind , Morena, Gwalior part of shivpuri
07	Special attributes	Spike Cylindrical Yellow anther, bristles absent exertion complete
08	Average yields	24-30q/ha
09	Scientist involved	Dr.G.S.chauhan,Dr.A.K.singh & Dr. R.K. Pandya
10	Year of release	2006
11	Notification/ registered	S.0.1178 (E) dt 20.07.07/Registered in NBPGR IC No.548533



**RVSBP -1 (OPV) Selected for VIC for state release in 2012**

- High Biomass Variety
- Grain yield: 20.81q/ha. Fodder yield :90q/ha
- Maturity :80-85 days



### **Promising Station Pearl millet Hybrid during 2012-13**

Medium height, Dark foliage, Thick panicle with bold grain 45.65

q/ha (80-85 days maturity)



### **Awards**

**Best Teacher Award in The field of Agriculture Education** by Gwalior Vikas Samiti on 5<sup>th</sup> September; (2012) to **Dr. A.K. Singh**, Professor & HOD (PBG).